FLIGHT
The AIRCRAFT ENGINEER & AIRSHIPS

First Aero Weekly in the World

Founder and Editor: STANLEY SPOONER

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport

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DIARY OF FORTHCOMING EVENTS

Club Secretaries and others desirous of announcing the dates of important fixtures are invited to send particulars for inclusion in the following list :—

1924

Nov. 7 .... **Col. N. T. Belaiew, C.B.: "Steel v. Lighter Alloys," before I.Ae.E.**

Nov. 12 .... **Mr. G. S. Wilkinson (Chief Designer, Napiers): "The Heart of a Lion," before Cambridge Univ. Ae.S.**

Nov. 13 .... **Professor L. Bairstow, C.B.E., F.R.S., F.R.Ae.S. (Zaharoff Professor of Aeronautics, University of London): "Skin Friction," before R.Ae.S.**

Nov. 19 .... **Mr. C. G. Grey (Editor, *The Aeroplane*): "Aircraft in the Next War," before Cambridge Univ. Ae.S.**

Nov. 21 .... **Dr. A. P. Thurston, M.B.E., F.R.Ae.S., M.I.A.E., Hons. Member: "Graphic Methods of Aircraft Structural Design," before I.Ae.E.**

Nov. 26 .... **Lt.-Comdr. S. E. Deacon, R.N.: "The Air Port of Croydon," before Cambridge Univ. Ae.S.**

Nov. 27 .... **Dr. G. C. Simpson, C.B.E., F.R.S. (Director, Meteorological Office): "Thunderstorms," before R.Ae.S.**

Dec. 4 .... **Colonel F. Searle, C.B.E., D.S.O. (Managing Director, Imperial Airways, Ltd.): "The Maintenance of Commercial Aircraft," before R.Ae.S.**

Dec. 5–21 **Paris Aero Show.**

EDITORIAL COMMENT.

The New Government

ONCE more the curtain has descended upon the latest of the all-too-lengthy procession of Air Ministers passing in an almost incessant stream across the political stage, and by the time this week's issue of FLIGHT is distributed to our readers it will in all probability be known who is to be our next Air Minister. It is regrettable that under the British constitution these changes should be necessary, and surely the time has arrived—a hope we have before expressed—when the heads of our fighting services should be placed outside political manipulation and thereby freed of the uncertainties with which they have hitherto been faced. As it is, a new Air Minister has barely time to begin to become familiar with his very specialised work before he is summarily removed from office, and a new man starts all over again. That the objection to this procedure is not, it is true, perhaps, as serious as might be expected at first glance seems to have been demonstrated by the work done by the late Air Minister and Under-Secretary of State for Air who are now "retiring." In the main they have but continued the policy inaugurated by their predecessors in office. Nevertheless, it should be evident that men with such vital reponsibilities would work under much more favourable conditions if they had the assurance that they would be left in peace, independent of political intrigue, to carry out their task.

Looking back upon the short period during which they have held office, the regime of Lord Thomson and Mr. Leach may be said to have had certainly no ill consequences, even if nothing very startling in the way of progress has been accomplished. In all fairness it should be admitted that both have had little time in which to do other than what they did do: continue the work to which they succeeded when they assumed office. Perhaps Lord Thomson, who has become personally popular everywhere, will go down in history as the Air Minister who definitely revived airships. It was significant that when he assumed office he took the title Lord Thomson of Cardington, and although his Government did not see fit to adopt

the Burney scheme, they did succeed in getting concrete results and in making a real start with a definite airship policy. Whether or not that policy is the best one possible, time will show. The great thing is that airships have been resurrected, so to speak.

By his very charming personality and his great tact, Lord Thomson has become liked and respected among all with whom he came in contact, and, setting aside political questions, his departure will be regretted. Of Mr. Leach perhaps the best that can be said is that, if his pacifist views were peculiar, they had no opportunity of doing any damage, and the work proceeded as planned by the previous Government.

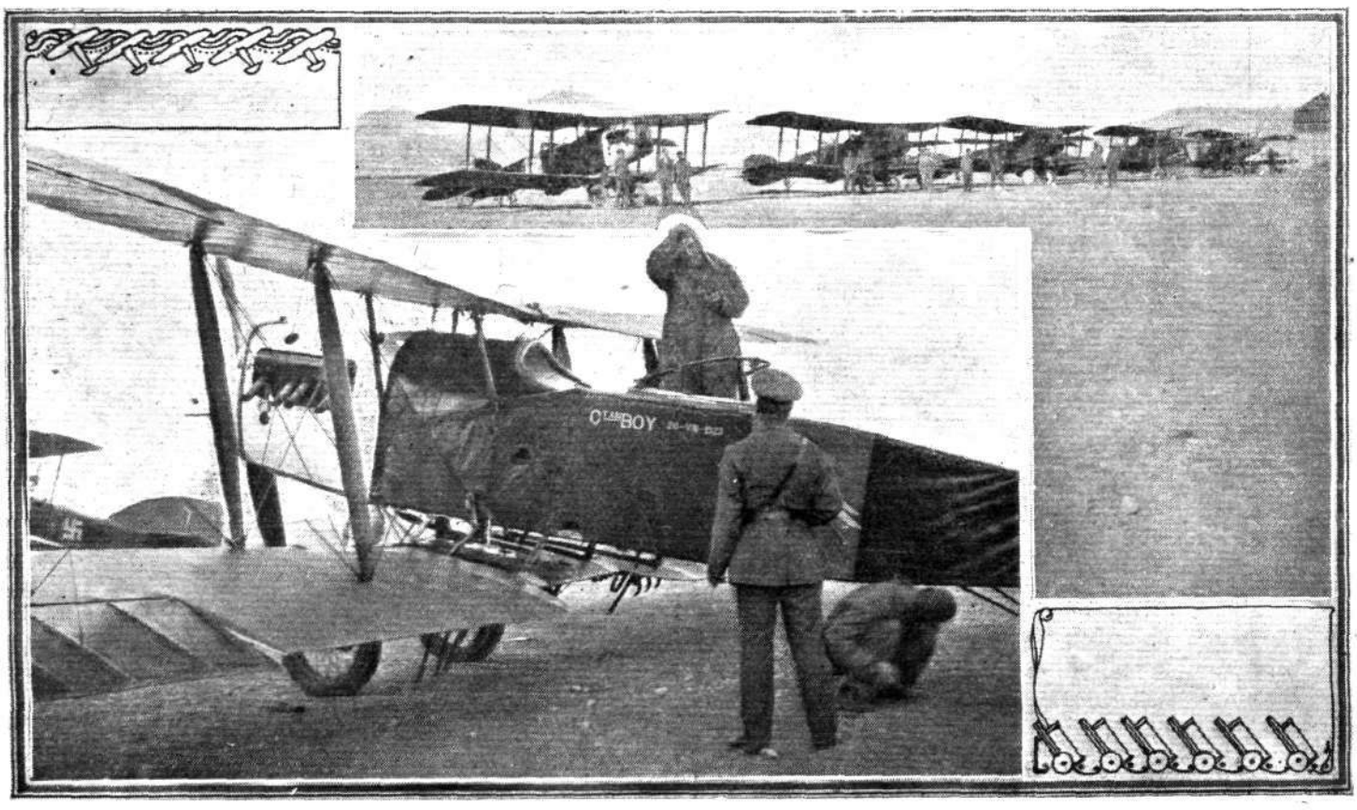
The question now naturally arises who will be the new Air Minister and Under-Secretary of State for Air. There is not much doubt that the former post will be filled by Sir Samuel Hoare, whose air policy has been followed by the Labour Government, and who would, therefore, be able to gather up the threads much as if he had never left office. He was, perhaps, the most "live" Air Minister we have ever had, and his work will still be so well remembered that there is little necessity for recounting it in detail here.

As Under-Secretary of State for Air it is to be hoped that the Duke of Sutherland will resume his old office. His Grace has shown a grasp of aviation matters which is little short of astounding, and he has done a very great deal in a private capacity also to help aviation. It would be impossible to imagine anyone better fitted for the position. As we have said, by the end of this week the problem will probably have been settled, and we sincerely trust Mr. Baldwin's choice will be as we have suggested.

Air Defence

Sir John Salmond is acquiring an almost unique experience of starting new posts in entirely novel circumstances and organising new departments *ab initio*. Few men at any time in history have undertaken two such tasks as the taking over of the defence of Iraq by the Royal Air Force and now taking over the air defence of Great Britain. For the institution of a command-in-chief of the air defences of this country, to which reference in made on p. 710, is no mere departmental reorganisation. It goes deeper than that, and may have the most far-reaching consequences. For instance, if it should ever be decided—which the Powers forbid!—to restore the R.F.C. and the R.N.A.S. to the War Office and the Admiralty respectively, it has now become certain that at least the air defence of the country will be left as a separate organisation in the hands of the Air Ministry and the Air Staff. What is more, we may feel confident that the press and the public will henceforth recognise the impossibility of weakening such an organisation as Sir John will surely build up. Hitherto air defence, which is, after all, a primary function of the Royal Air Force, has been tangled up with army co-operation and other matters under the control of the Inland Area. Now that this vital feature of our safety is to be placed apart in an organisation of its own, under an officer entitled Commander-in-Chief, it receives the dignity which is its due, and its importance must be recognised by all.

To put this new and vital force on a satisfactory basis, to give it a good start, to inaugurate good, though possibly temporary, relations with the War Office in respect to the anti-aircraft batteries (which certainly ought to be under the Air Ministry), no better man could be found than Sir John Salmond.



BRISTOL FIGHTERS IN MOROCCO: Above, a batch of Bristol Fighters lined up ready for active service with the Spanish Aviacion Militar against the Moors. Below, General Lanjurjo of the Spanish Aviacion Militar alighting from a Bristol Fighter after a flight over the enemy line.

FLIGHT

THE CURTISS "P.W.8" BIPLANE

A Successful American Single-Seater Fighter

MOST of our readers will, no doubt, remember the splendid dawn-to-dusk flight from New York to San Francisco made by Lieut. R. L. Maughan on June 23 last, when he covered the 2,670 miles in 21 hours 44 mins. The machine Maughan flew on this occasion was a standard model P.W.8 Persuit 'plane—one of an order of 25 machines built by the Curtiss Aeroplane and Motor Co., of Garden City (L.I.) for the U.S. Army Air Service. Apart from the interest attached to this machine in connection with the above flight, the P.W.8 is in itself worthy of notice inasmuch as it is claimed to be one of the most successful machines of its type amongst modern aircraft.

The P.W.8 is a development of the Curtiss racers which have, since 1922, established world's records for speed. These racers served the purpose of testing out the ideas evolved in the aerodynamic laboratories of the Curtiss Co., and when the results obtained in the various tests and racing events confirmed the theory, the new ideas involved were put into practice and were embodied in the 1924 model P.W.8 Persuit 'plane described herewith.

As may be gathered from the accompanying illustrations, the P.W.8 is a single-seater tractor biplane of the two-bay type—that is, with two sets of interplane struts each side of the fuselage. It is fitted with the Curtiss D.12 (high or low compression) engine and with wing radiators. The wings are of cellular construction, built entirely of wood, being covered with a special spruce plywood, known as Curtiss-ply. Instead of having two main spars, as in the usual type of wing, these wings have multiple spars, which, together with the ribs divide it up into a great number of square cells, forming, with the outer covering of Curtiss-ply, an extremely strong and rigid construction. The outer covering of Curtiss-ply is shaped to the correct form before it is applied, and therefore fits the wing frame like a mould. It is fastened to the framework with cement, brass screws and cement coated nails.

From the point of view of vulnerability to gun fire the advantages of this type of construction are obvious, for several cells may be shot through without impairing the strength of the structure, whilst, of course, a fabric covered wing would tear where punctured by a bullet. Apart from this, however, the cellular construction has the further advantage that it does away with internal drag bracing with its adjustments. The top plane has a fairly pronounced forward stagger of 3 ft. 1 in., and is mounted close to the top of the fuselage. Upper and lower planes are of equal span, but the chord of the lower plane is 18 ins. less than that of the top plane.

The interplane struts are of the N type, of steel tubes faired with spruce and taped. They are adjustable as to length by means of threaded terminals. There are no projecting fittings on the wing, as all these are countersunk. Aileron and engine controls are in the form of rigid rods, giving positive action and obviating the necessity of replacing cables worn out by running over pulleys, etc. Where necessary inspection doors are provided on the wings for the controls. All the control and stabilising surfaces are built up on steel framework and covered with fabric. The horizontal stabiliser is adjustable from the pilot's cockpit during flight.

As previously stated, wing radiators are employed, these being fitted in the top plane, where they extend from the centre section as far as the inner pair of interplane struts. They are so constructed that the upper and lower surfaces on any wing panel may be removed separately, thus greatly facilitating repairs.

The fuselage is of four-longeron girder construction, built up of welded steel tubing, with welded vertical and horizontal struts, cross braced by tie-rods. The lugs to which the latter are attached are welded into slots cut in the tubes, so that no welded part is in tension. A false frame-work of channel section duralumin members carries the fabric covering and gives the fuselage a good streamline form.

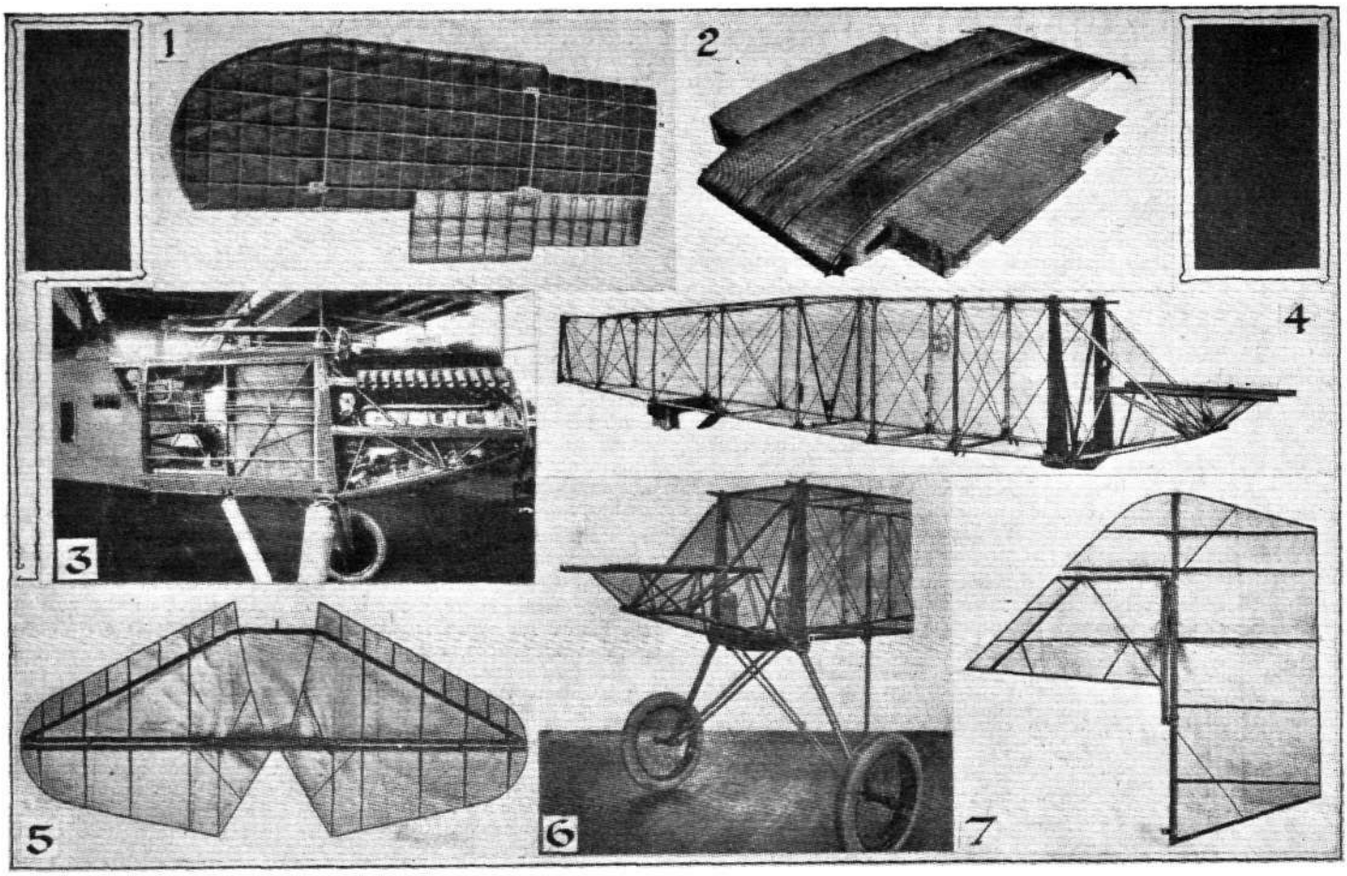
The engine mounting is easily and quickly detached by the removal of four bolts, thus enabling a change of power plant being made in a very short time. All parts of the engine, petrol and oil systems, instruments and controls are exceptionally accessible, owing to the fact that the cowling and fuselage covering as far back as the cockpit is removable in large sections. These sections do not overlap at any of the joints, thus enabling any one section being removed without disturbing the others.

THE CURTISS P.W.8 PERSUIT BIPLANE: A successful American single-seater fighter, fitted with a Curtiss D. 12 engine. It was on this type of machine that Lieut. R. L. Maughan made his great Dawn-to-Dusk flight from New York to San Francisco, on June 23 last.

An important feature as regards the engine is the oil temperature regulator. This consists of a number of honeycomb tubes through which the water from the motor is passed and around which the oil circulates. Once the engine is started the water passing through the regulator soon brings the oil up to the required temperature. During flight the temperature of the water is controlled by means of bypass valves to the wing radiators. Thus, the regulator performs two functions, that of heating the oil on the ground before flight, and that of keeping the oil more or less cool during flight.

The pilot's cockpit is located well back of the top plane, and the visibility is excellent—an important factor with a machine of this type. The pilot's eyes are on a level with the chord of the top plane, giving a minimum blind spot due to the wing, while the lower wing being staggered well back, allows of a good view downward and forward. The height and fore-and-aft position of the pilot's seat is adjustable, thus allowing for "out-sizes" of pilots. Crash-proof, rubber-covered petrol tanks are fitted, lessening the risk of fire in the event of a crash. Provision is also made for a parachute.

Another very interesting feature of the "P.W.8" is the somewhat novel type of undercarriage. Of the axle-less type, the wheels are mounted on two V-struts, with the absorbers carried inside the fuselage, where they are easily accessible. These shock absorbers are in the form of rubber



SOME CONSTRUCTIONAL DETAILS OF THE CURTISS P.W.8 : 1. One of the " cellular " wing panels, which is covered with Curtiss-ply. 2. Centre-section wing radiator unit. 3. Engine and fuel tank section of the fuselage. 4. The tubular steel fuselage. 5 and 7. The welded steel tail units. 6. Engine mounting.

compression discs, against which the bearing plate of the landing gear strut works. The compression of each absorber may be adjusted by the turning of a nut, and the hardened rubber discs can be replaced with ease. The fact that the rubber discs work in compression and not in tension is a desirable feature in arid climates, where rubber quickly deteriorates under tension. The advantages of an axleless undercarriage are, of course, obvious.

The armament of the P.W.8 consists of two Browning machine guns, one of 30 calibre and one 50 calibre, with 600 rounds of ammunition for the former and 200 rounds for the latter. Provision is also made for two 105 lb. demolition bombs or five 25 lb. fragmentation bombs.

Span	32 ft. 0 ins.
Chord (top)	5 ft. 6 ins.
Chord (bottom)	4 ft. 0 ins.
Overall length	23 ft. 7 in.
Height	9 ft. 1 in.
Gap	4 ft. 7½ ins.
Stagger	3 ft. 1 in.
Wing section	C 62
Area of main planes	279·3 sq. ft.
Area of ailerons	20·3 sq. ft.
Area of tail plane and elevators	24·76 sq. ft.
Area of fin and rudder	13·55 sq. ft.
Weight empty	2,196 lbs.
Useful load	971 lbs.
Weight laden	3,167 lbs.
Fuel capacity	77 gals.
Oil capacity	8 gals.
Factor of safety	12

The performance of P.W.8, with low compression and high compression D.12 engines is :—

	Low Compression.	High Compression.
Engine horse-power	420	460
R.p.m.	2,200	2,300
Loading/h.p.	7·6 lbs.	6·8 lbs.
Loading/sq. ft.	11·33 lbs.	11·33 lbs.
Speed range	63-171 m.p.h.	63-180 m.p.h.
Climb, ground level	1,850 ft./min.	2,085 ft./min.
Service ceiling	20,350 ft.	24,100 ft.
Absolute ceiling	21,500 ft.	25,400 ft.
Endurance	2·75 hrs.	2 hrs.
Fuel consumption	0·53 lb./h.p./hr.	0·58 lb./h.p./hr.
Oil consumption	0·015 lb./h.p./hr.	0·015 lb./h.p./hr.

Schneider Cup Race Postponed

THE National Aeronautic Association of U.S.A. has written to the Royal Aero Club stating that owing to the withdrawal of the Italian entry and the accident to the British machine the Americans would not claim a walk over in the Schneider Cup, and the race this year would therefore be cancelled. The Royal Aero Club has cabled the National Aeronautic Association of U.S.A. expressing its warmest appreciation of the sporting action of America, and also the hope that England would be fully represented in next year's race.

Air Patrols in British Columbia

AIRCRAFT have been doing good work in connection with patroling the Salmon Fisheries in British Columbia since 1921, and have by now proved beyond doubt that such work is of considerable value. During the three months of the salmon fishing season this year, the air patrols have flown more than 10,000 miles. Thousands of small craft are engaged on the fishing grounds of the Columbian coast, and licences issued to fishermen are limited to certain areas, and permit the use only of certain kinds of tackle. Before the introduction of the aerial patrols the only way of detecting violations of the regulations was by means of fast patrol boats, which were easily detected by the lookouts, enabling poachers, etc., to leave the prohibited area before the patrol arrived. Now, on discovering an offending boat, the aeroplane summons a patrol boat by wireless.

In addition to their work as guardians of the fisheries, the two machines employed this summer have done valuable work in mapping distant parts of the coast. The airmen also discovered and photographed hundreds of small lakes near the coast which are shown on no existing maps of British Columbia.

FLIGHT

LIGHT 'PLANE AND GLIDER NOTES

Those wishing to get in touch with others interested in matters relating to gliding and the construction of gliders are invited to write to the Editor of FLIGHT, *who will be pleased to publish such communications on this page, in order to bring together those who would like to co-operate, either in forming gliding clubs or in private collaboration.*

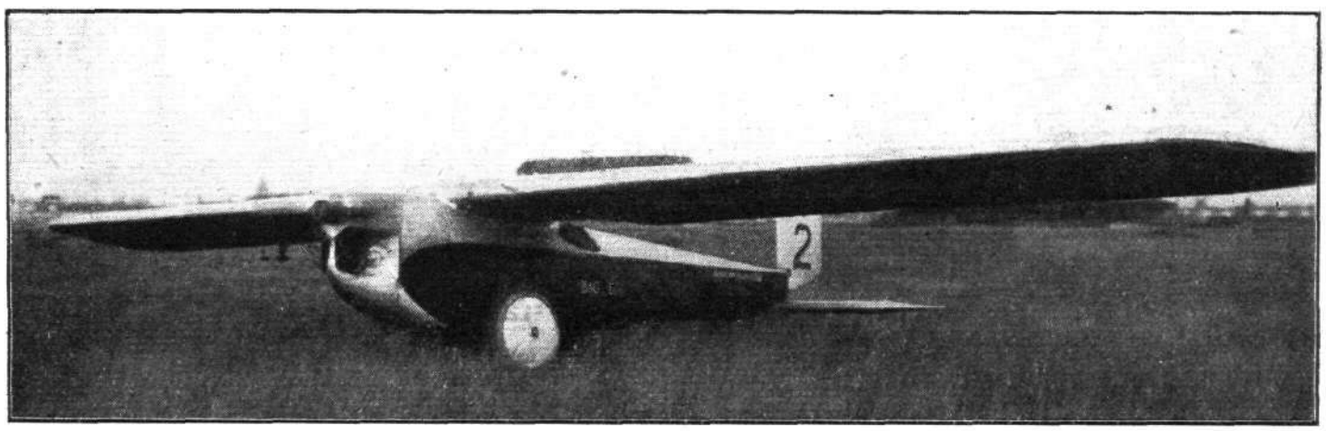
FOR the first time since the holding of the Lympne light 'plane competitions, there has been an opportunity of discussing the results and the lessons to be learned. The paper by Major Buchanan afforded the opportunity, and it is gratifying that so many well-known aviation people managed to be present at the meeting of the Royal Aeronautical Society. Major Buchanan's paper was of more than usual interest, and perhaps the chief merit of it lay in the comparison made between the performance of the single-seaters of 1923, the two-seaters of 1924, and the commercial aeroplanes that took part in the Martlesham trials in 1920. The lecturer was somewhat criticised for taking as a basis of comparison, in dealing with structural design, the structure weight of the two-seaters, and several speakers afterwards pointed out that many of the items usually included in the structure weight were nearly as heavy as the corresponding items in large machines.

* * *

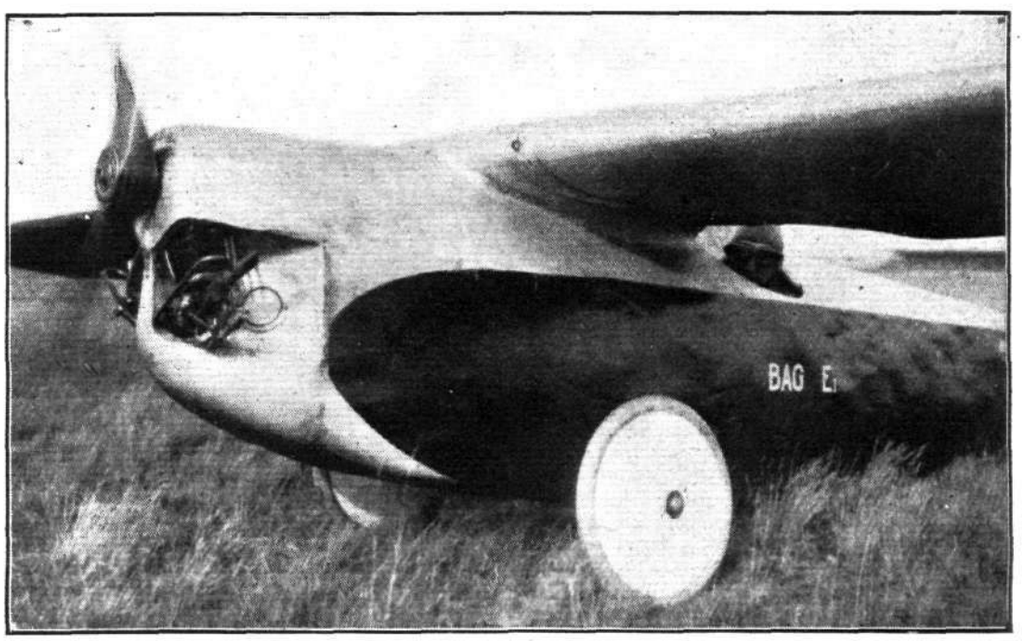
IN the monoplane *versus* biplane controversy, the lecturer having stated that the biplanes suffered from engine trouble to such an extent as to make comparisons distinctly unfair to the biplanes, Mr. W. O. Manning made the point that the question of engine failure was interconnected with that of aerodynamic efficiency, and that the more inefficient the machine the greater the load on the engine. This point was not disputed by the lecturer, although it might have been on the score of the Cranwell biplane, which could certainly not be regarded as the most efficient machine at Lympne, but whose engine nevertheless ran for more hours, and probably much nearer its full power for extensive periods, than the engine of any other machine in the competition. While everyone will probably agree with Mr. Manning on general principles, the competitions certainly cannot be said to have proved his contention.

* * *

As a result of Major Buchanan's lecture and the discussion that followed it, there is now a possibility of forming some sort of impression of the general feeling of those best qualified to judge in matters relating to light 'planes. For instance, it seems fairly clear that there is a tendency to regard with disfavour the suggestion of increasing the engine power, at any rate to any considerable extent. The question of whether the 40 h.p. or so which is accepted as being approximately the power required for a two-seater light 'plane is to be obtained from a high-speed engine of small capacity or from a slow engine of larger capacity, still remains unsettled. It is generally admitted that the 40 h.p. is sufficient if coupled with good reliability, but the question of reliability is intimately bound up with that of the high-speed, high-class engine *versus* low-speed less refined engine. It seems probable that the best solution might be, as suggested by Capt. Sayers, to limit the weight of the engine and



A NEW GERMAN LIGHT 'PLANE : The "BAG E.1" Bahnbedarf Darmstadt on which recently Herr Botsch flew from Darmstadt to Johannisthal (Berlin), a distance of 310 miles, in 3½ hours.



This photograph gives a good idea of the engine cowling, wing attachment, pilot's cockpit, etc., of the Darmstadt "BAG E.1." The engine is a Blackburne.

its fuel (as consumed during normal running in a machine) for a certain stated period, such as three hours, to some definite figure, and then leave it entirely to the designers of engines and machines to do the best they can under those conditions.

* * *

THE question monoplane *versus* biplane cannot be said to be any nearer a solution, and it seems likely that in the future there will be room for both types. The biplane would appear to score on the point of lightness, and the monoplane on robustness, and probably to some small extent on cheapness. This brings us to the question of price. As Col. Tizard pointed out, we have certainly not yet obtained the cheap aeroplane, but on the other hand it is probably wiser to strive for the efficient and effective machine and engine first, and then, having found them, to see what we can do in the matter of price reduction. Sir Henry White-Smith's very sound suggestion that the Air Ministry make it a condition in any future competitions that machines ordered in batches are to be sold for a certain predetermined price should help.

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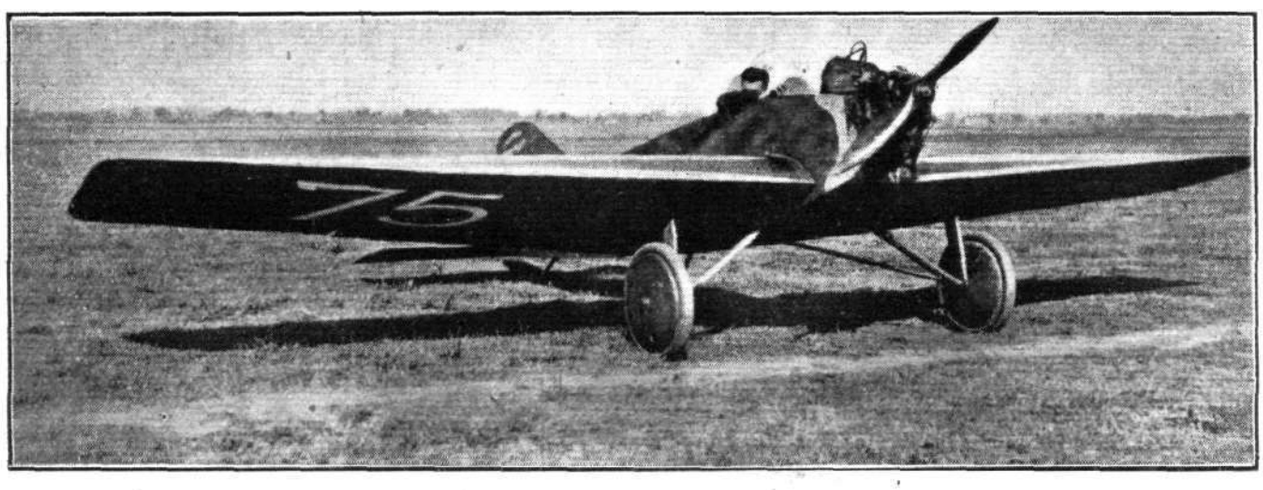
INCIDENTALLY, the whole problem of price reduction is intimately connected with the Air Ministry's attitude in the matter of airworthiness certificates, etc. If the Ministry takes a reasonable view it should be possible to build these machines in quantities at a very reasonable figure. On the other hand, if A.I.D. inspection of every bolt and nut is insisted upon, the price will necessarily remain high. As we have stated, until our readers must be thoroughly "fed up" with reading it, British aircraft constructors may be relied upon not to turn out any machine that is at all likely to be structurally weak. Their reputation is at stake, and should prove at least as effective a safeguard as any system of A.I.D. inspection. For instance, what we have in mind is that so long as the Air Ministry holds up its hands in horror at some form of construction which is not "approved," so long will the price of light 'planes remain high. A case in point is the Fokker welded steel tube fuselage. We do not suggest that this is necessarily a good form of construction for light 'planes. Quite possibly it is not. In the larger machines, however, it is probably the cheapest form of fuselage construction ever employed, and in actual practical flying it has proved itself quite satisfactory. Yet it would never be tolerated in this country. If some British designer succeeds in devising a form of construction equally "unorthodox," and which practical destruction tests prove to be sufficiently strong, will the Air Ministry sanction it? Frankly, we doubt it.

THE DORMOY "BATH TUB" AT DAYTON: This parasol monoplane, with short nacelle and open tail booms, is fitted with a four-cylinder Henderson engine.

* * *

QUITE recently a very fine flight was made in Germany on a light monoplane fitted with a British engine. The machine in question was the Darmstadt "BAG E.1," and the engine a Blackburne "Tomtit," mounted inverted in the manner invented by Mr. Shackleton for last year's A.N.E.C. monoplane. The machine is fairly well shown in our photographs this week. One of these shows the complete machine, while the other is a close-up of the nose, undercarriage, etc. Leaving Darmstadt the "BAG E. 1" headed towards Berlin, which was reached 3½ hours later. The distance is approximately 500 km. (310 miles), so that the speed works out at 88½ m.p.h., which is distinctly good. It may be taken for granted that a following wind helped materially. The pilot was Herr Botsch, famous for his flights on the Darmstadt "Consul" glider.



THE MUMMERT LOW-WING MONOPLANE: This machine won one of the events at Dayton. Note the very wide wheel-track. The engine is a Harley-Davidson.

TECHNICAL details of the machine are not available, but the photographs give a very good idea of the general lines. Built by the Bahnbedarf A.-G., of Darmstadt, the "BAG E.1" is a pure cantilever monoplane with plywood covered fuselage. It has the high aspect ratio wing so beloved by German designers, and the attachment to the fuselage is one of the most interesting features. It will be seen that the deck fairing is fairly narrow, so as to give a good view forward, and to the top of this fairing the wing spars are secured. The width over supports is very small, and it would appear that the attachment, unless it is very heavy, must be relatively weak as regards resisting torque loads. The undercarriage is of the type in which the axle projects through the sides of the fuselage and is enclosed in streamline fairings.

* * *

ANOTHER German light monoplane which has been doing a good deal of flying lately is the Caspar C.L.E. 17 with A.B.C. "Scorpion" engine. This machine, designed by Herr Dipl. Ing. Ernst Ritter von Loessl and built by the Caspar Werke of Trawemünde, is a low-wing cantilever monoplane two-seater, and one of the most interesting features is the flexibly-mounted wings. Springs are incorporated at the points where the wing spars attach to the wing roots, and it is stated that the machine is extremely steady in gusty weather. The top speed of the Caspar is about 115 km./h. (72 m.p.h.).

* * *

LAST week we gave a brief account of the two light 'plane races at Dayton, of which one was won by the Driggs-Johnson monoplane and the other by the Mummert low-wing monoplane. In the race for the Rickenbacker Trophy, E. Dormoy's "Bath Tub" was first, with the Driggs-Johnson second. The Mummert forced-landed and retired.

* * *

THE Dormoy "Bath Tub" was designed by one of the designers at McCook, Field, Mr. Dormoy, and is, it will be seen, in some ways reminiscent of the BAT "Crow" designed and built by Mr. Fritz Koolhooven some years ago. It is a parasol monoplane with open tail girder, and in view of the number of struts and bracing, it is not surprising to learn that the machine is somewhat slow.

* * *

THE Mummert is a low-wing monoplane of fairly normal design, its most unusual feature being the wide-track undercarriage, whose compression struts are attached to the wing some distance out from the fuselage. The chances of turning the machine over onto a wing tip should, therefore, be remote.

* * *

THE Driggs-Johnson is a parasol monoplane in which the space between the top of the fuselage and the undersurface of the wing is enclosed in a celluloid casing forming the upper portion of the pilot's cabin. The view is said to be particularly good, although most pilots would probably prefer to be seated out in the open.

A NEW "AVRO" AERODROME

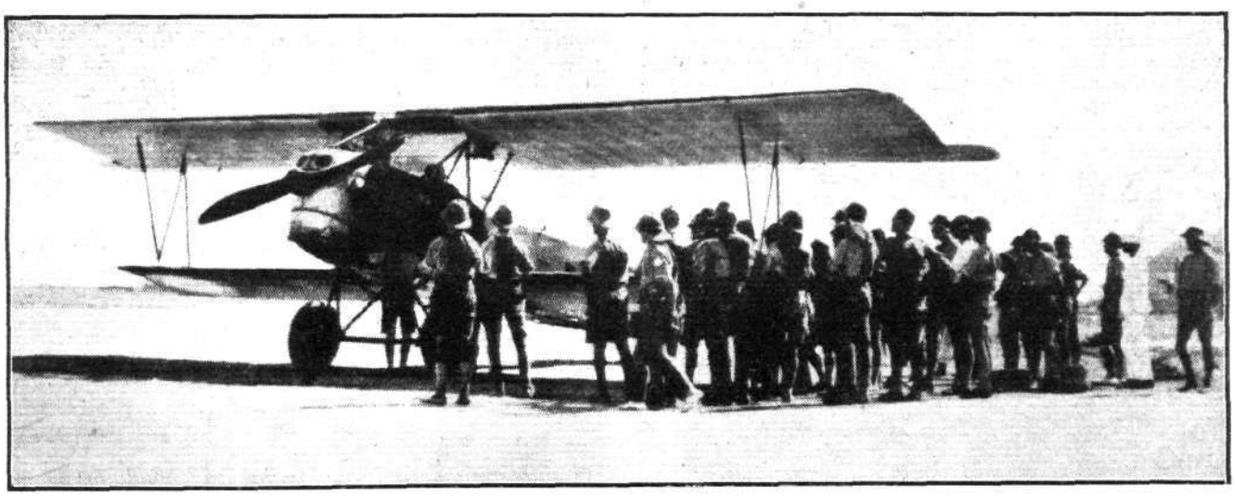
A. V. ROE AND CO., LTD., the pioneer aeroplane manufacturers, have purchased a large tract of land, approximately 163 acres, at Woodford, Cheshire, for a new aerodrome. The new aerodrome will, when completed, be one of the finest in the country, and its acquisition by A. V. Roe and Co., Ltd., undoubtedly marks another forward step in aviation. Flying will commence in about two months' time, but it is expected that the aerodrome will not be really completed for about a year.

The firm have just vacated the aerodrome at Alexandra Park, Manchester, which, whilst it has answered the purpose for a number of years, has certain disadvantages which will be absent in the one just acquired. In the first place atmospheric conditions are considerably better at Woodford than in Manchester. Woodford is outside the smoke ring. It is situated between the Macclesfield hills and Alderley Edge, and even when there is fog in Manchester and in Macclesfield it is usually clear in Woodford. It will be recognised that this is a tremendous advantage from a flying point of view.

Another point is the roominess of the new aerodrome. The area at Alexandra Park was approximately 88 acres, of which 33 were taken up by hangars and other smaller buildings, leaving a flying ground of 55 acres. Further, this area is being rapidly closed in by buildings, another decided disadvantage. At Woodford there are 163 acres available, and the surrounding country is open.

The three largest hangars and certain other equipment at Alexandra Park aerodrome have been purchased by A. V. Roe and Co., Ltd., and are being removed to Woodford. The removal of the hangars presents considerable difficulty owing to size. In each hangar there are 18 roof trusses, measuring 105 ft. in length and weighing between 3 and 4 tons. These 54 roof trusses have to be moved by road, and the problem of their transport has been solved by Mr. W. Kayley, who is employing a steam tractor and three trailers for the job.

The future of the new aerodrome should be a very bright one. It will in all probability become the recognised aerodrome for the area, and it is within the bounds of possibility that it may be used under the Air Ministry scheme for training of Reserve Pilots. It is interesting to note that the aerodrome is well situated from the point of view of connecting up with the railway or for travelling to Manchester on alighting from a 'plane at Woodford. Stockport is only five miles from the aerodrome, Wilmslow two miles. Both are main line stations. Alternatively a car will reach Manchester in about half an hour.



MAJOR ZANNI'S WORLD FLIGHT: The above photograph shows Major Zanni's Fokker-Napier arriving at Hinandi, Iraq. The Argentine airman has got as far as Tokio, but owing to the lateness of the season he has decided to abandon the flight. Major Zanni has taken 19 flying days for his Amsterdam–Tokio flight—one day less than Pelletier d'Oisy's Paris-Tokio flight. The first 7,500 miles (Amsterdam-Hanoi) was accomplished in 17 flying days and with one Napier "Lion." Then the machine stuck in the mud and was crashed. The rest of the journey was completed on a new Fokker-Napier. Major Zanni, in a cable from Tokio, says:—"Very delighted state two Napier engines worked admirably until now without slightest indication trouble wear, and without any necessity change or touch parts."

AIR DEFENCE

Air Marshal Sir John Salmond Appointed Commander-in-Chief

THE Air Ministry announces that Air Marshal Sir John Maitland Salmond, K.C.B., C.M.G., C.V.O., D.S.O., has been selected to fill the post about to be created, with effect from January 1 next, of Air Officer Commanding-in-Chief, Air Defence of Great Britain. The command to which Sir John Salmond has been appointed is a new command instituted in consequence of the scheme for the defence of the United Kingdom against air attack which was approved by H.M. Government last year. It will be recollected that this scheme embraces the formation of 52 squadrons as a Home Defence force, together with the necessary ground defences to be provided by the army, consisting of anti-aircraft batteries, searchlights, etc.

Before discussing further the re-organisation involved, it may be useful to recall briefly the career of Sir John himself. Born in 1881 at Kensington, he was educated at Wellington, where so many good soldiers have learnt Latin and algebra. He received his commission in the King's Own Royal Lancaster Regiment during the South African War, and was fortunate in spending his first two years of soldiering on active service. Ten years later he took his pilot's certificate from the Royal Aero Club. It is dated August 13, 1912, and the number is 272. In the following November he was appointed instructor at the Central Flying School at Upavon, for the Royal Flying Corps was then just beginning to train its own pilots. When the Great War broke out, Major Salmond, as he then was, was in command of No. 3 Squadron, which was equipped with Henri Farmans and Blériots. Together with Squadrons 2, 4 and 5 they went to France and took part in the retreat. The flight commanders, who, fortunately, are all alive and serving in the Royal Air Force today, were P. L. W. Herbert (now Group Captain), L. E. O. Charlton (now Air Commodore), and P. B. Joubert de la Ferte (now Group Captain). It is believed to have been Charlton who first brought in news of the turning movement of Von Kluck which decided Sir John French to commence the retreat from Mons. Incidentally, Sir John's brother, Geoffrey, was then on the staff of General Henderson.

On February 18, 1915, Major Salmond was awarded the Distinguished Service Order, not for any deed of personal daring do, but for his admirable services in command of his squadron. In April of that year he was given command of the 2nd Wing, and in 1916 he was promoted to Brigadier and put in command of the 2nd Brigade. In the following year he became a Major-General, and towards the end of that year he became Director of Military Aeronautics at the War Office, with a seat on the Air Board. In January, 1918, he succeeded Sir Hugh Trenchard as G.O.C. the R.F.C. in France, and as such he was responsible for all air operations during the great German advance in that spring, and afterwards during the final victorious advance of the British army. He remained on to command the Air Force of Occupation until, in August, 1919, he was recalled to England to command what was then the Southern Area. He was then an Air Vice-Marshal. In 1920 reorganisation took place, and the present arrangement of dividing the whole Royal Air Force in this country into an Inland and a Coastal Area was introduced. Sir John was given the command of the Inland Area, which he held until he was sent to India on a special mission in 1922 to inquire into the very unsatisfactory conditions of the Royal Air Force units there, which had been kept shockingly short of spares by the Indian Government, then suffering from one of those disastrous attacks of economy to which all British Governments were prone in the years after the War, and of which aircraft was always the most pitiable victim.

From India, Sir John passed on to Iraq, where he assumed command, not only of the R.A.F. units, but of the whole responsibility for the defence of the country from foreign foes and from turbulent Shaikhs in its own deserts. Hitherto Iraq had been part of the Middle East Command, so far as the R.A.F. was concerned, so that Sir John succeeded his brother, Sir Geoffrey, in that country, but with greatly increased powers and dignity. Never before had the Royal Air Force undertaken the defence of a country. Never before had units of the army been placed under the command of an air officer. The position was unprecedented, and Sir John had to create precedents for everything. As proof that his work was well done, we need hardly go further than the glowing terms in which the work and condition of the R.A.F. in Iraq were described by the Air Minister, Lord Thomson, at the conclusion of his recent visit to that country.

In April of the present year Sir John, now a full Air Marshal, took six months' leave, came home, and got married. Now, after a honeymoon somewhat longer than most men are able to enjoy, he once again takes up a position which no man has held before.

According to the present sanctioned programme, the Air Defence force is to consist of 52 squadrons, of which 13 are to be Special Reserve and Auxiliary squadrons. Sir John will find 18 regular squadrons more or less completed, and will take them over from the Inland Area, which will be left free to concentrate its attention on schools of instruction and Army Co-operation. The 18 squadrons are :—

No.	Description.	Present constitution.	Equipment.	Station.
3	Fighter	H.Q. & 2 flights	Snipe	Upavon
7	Bombing	,, 2 ,,	Virginia	Bircham Newton
9	,,	,, 1 ,,	Vimy	Manston
11	,,	,, 2 ,,	Fawn	Netheravon
12	,,	,, 2 ,,	,,	Andover
15	,,	,, 3 ,,	D.H.9a	Martlesham
17	Fighter	,, 2 ,,	Snipe	Hawkinge
19	,,	,, 2 ,,	,,	Duxford
22	Bombing	,, 3 ,,	(?)	Martlesham
25	Fighter	,, 3 ,,	Grebe	Hawkinge
29	,,	,, 2 ,,	Snipe	Duxford
32	,,	,, 3 ,,	,,	Kenley
41	,,	,, 2 ,,	Siskin	Northolt
56	,,	,, 3 ,,	Snipe	Biggin Hill
58	Bombing	,, 1 ,,	Vimy	Worthy Down
99	,,	,, 1 ,,	Aldershot	Bircham Newton
111	Fighter	,, 2 ,,	Siskin	Duxford
207	Bombing	,, 3 ,,	D.H.9a	Eastchurch

The above list is compiled from the November Air Force List, which gives the state of affairs up to the beginning of October, so that probably some of the squadrons are in a more advanced state by now, and some re-equipment with newer types of aircraft may have begun. The Snipe and the Vimy, for example, are obsolescent, and will be replaced in due course, we hope before long. It should be added that fighter squadrons will be provided only by the regular air force, the Special Reserve and Auxiliary Air Force providing bombing squadrons only.

The regulations for the special reserve and the auxiliary air forces have not yet been issued. The difference between the two will be analogous to the difference between the old militia and the old volunteer forces. The S.R. squadrons will be maintained on a basis of about 33 per cent. regular personnel and the remainder skilled artisans who will be called up for short periods of training in the district where they live. The auxiliary squadrons will have a small nucleus of regular personnel for instruction and administration, but in the main they will be composed of citizen airmen. It is proposed to locate the squadrons in the large industrial centres where a plentiful supply of skilled mechanics is available and "drills" can be held frequently throughout the year.

In the regular squadrons also it is proposed to carry out almost all the non-technical work, which is estimated at about 25 per cent. of the whole, by civilian labour. Compared with air force labour, this will be cheap, and an increase of less than 10,000 officers and men in the R.A.F. is all that is anticipated, namely an increase of about one-third. At the same time the striking power of the Home Defence air force will be doubled.

It remains to be seen how this will work in practice. Until the regulations for the Special Reserve and the Auxiliary forces are issued, comment must be reserved. On the facts before us it would appear that the most difficult part to arrange will be the accurate rigging of the aircraft in the Auxiliary Air Force. For the larger policy of isolating the Home Defence air force there can be nothing but praise. In the first place it makes Great Britain safer, and in the second place it makes the Royal Air Force safe.

IT is notified in the *London Gazette* that the King in Council on October 9 approved the drafts of two Orders in Council made in pursuance of the Air Force Constitution Act, 1917, entitled respectively "The Auxiliary Air Force Order, 1924," and "The Air Force Reserve Order, 1924."

FLIGHT

ROYAL AERO CLUB LIGHT AEROPLANE COMPETITIONS

Some Interesting Comparisons made by Major Buchanan

THE paper read by Major J. S. Buchanan, of the Technical Department of the Air Ministry, before the Royal Aeronautical Society on October 30, was an uncommonly long one, and was, notwithstanding certain criticisms advanced during the discussion, of more than ordinary interest. The meeting was held in the library of the Royal Aeronautical Society, and was extremely well attended—so much so, in fact, that for once the more usual meeting-place might have been preferable. Colonel Tizard was in the chair.

Major Buchanan commenced by giving a brief historical sketch of the various steps that have led up to the construction of this year's two-seater light 'planes, commencing with the German and British gliding trials of 1921-22 and 1922 respectively, and tracing the development through the single-seater trials last year to the Lympne meeting recently concluded. As these various trials, and the machines used, are already familiar to readers of FLIGHT, it is not proposed to repeat in full this section of Major Buchanan's paper, except to mention that he stated that the engines used (in the 1923 competitions) which were of motor-cycle type, ran very well on the whole, and that, in general, the most reliable power units were those in which the propeller was driven directly off the crankshaft. The power loading, in the same trials, varied from 17·7 to 60 lbs./h.p., but the majority of types were in the neighbourhood of 30-35 lbs./h.p. Generally speaking, the lecturer stated, it could be said that the power loading of 30-35 lbs. /h.p. gave sufficient power for reasonable flight with the wing loadings employed.

In commenting on the 1923 single-seaters, details of which were given in a large table, the lecturer stated that the D.H.53 had been supplied to R.A.F. units (six machines), and had been flown by a large number of R.A.F. officers. The machines were standing up to ordinary service in a satisfactory manner. Sufficient test data were not available to give exact information of the aerodynamic efficiencies of the 1923 single-seaters, but the Gnosspelius "Gull" had an L/D ratio of 14 to 1. This compared very favourably with the k_L/k_D of military and civil types, which were of the order of 5/1 to 8/1. One factor which might contribute to this improved efficiency was that the engine exerted very much less influence on the design than was the case with normal aircraft. It would be seen, the lecturer said, that the power unit percentage was small, but, further than that, the engine was of such a size as to fit easily into any fuselage capable of accommodating a man. For this reason, as well as on account of the absence of extraneous equipment, a clean fuselage line was possible. The lecturer then showed tables of percentage weights of components of the 1923 and 1924 machines. As these figures are of considerable interest they are given in the annexed table.

Turning to the 1924 competitions for light 'plane two-seaters, Major Buchanan showed a slide giving in tabular form the main dimensions, weight, engine, recorded performance, etc., of the 1924 Lympne machines. One column gave the speeds over the ten laps of the course, and in another the figures for a single lap, where available, were given. The highest speed recorded, the lecturer stated, was 79 m.p.h. (the Beardmore "Wee Bee"), and the lowest 37.22 m.p.h. (the Parnall "Pixie III"). The former had a speed range of approximately 2 to 1, which was a notable performance for a weight/h.p. ratio of 26·8. The length of run to take off and pull up were distinctly good, and compared favourably with those obtained with large commercial aeroplanes at Martlesham in 1920.

In his remarks on the 1923 single-seater competition machines the lecturer stated that many of the undercarriages were unsatisfactory, but in the case of this year's two-seaters the undercarriages were distinctly superior to those fitted in 1923. The Short "Satellite" and Avro "Avis" were fitted with a form of oleo undercarriage, and the results obtained were entirely satisfactory. The Westland was fitted with an undercarriage with a steel spring return and a Ferodo-lined tube to absorb energy. The Bristol Co. entered one monoplane with a complete all-metal structure. The production of an aeroplane of this size in metal was a distinct achievement, but the lecturer thought it would be a matter of extreme difficulty to produce such an aeroplane at a reasonable price.

Monoplane *versus* Biplane

On the question monoplane or biplane, Major Buchanan continued:—"It is of interest to note that nine biplanes were presented to the judges as against six monoplanes, showing that designers in this country as a whole consider that for all-round suitability—that is, for performance and robustness in handling—the biplane is the superior type.

"It is difficult from the results of the competition to sort out the relative aerodynamic efficiencies and performances of the two types. Monoplanes won the principal prizes. The reliability prize and the second prize for taking off and landing were won by biplanes, so that so far as actual prizes were concerned the monoplanes were easily first. The actual results, however, were so much affected by engine difficulties that the above comparison is of very little technical value, and is distinctly unfair to the biplane. Many of the aeroplanes were unable to finish the ten laps of the speed test, and for that reason were awarded no marks for speed range. All of them, however, were able to finish one lap of the high-speed course, and if this measurement is taken as a basis of working, there is a considerable difference in the relative positions. The Beardmore monoplane is still first. Immediately behind is the Hawker biplane (A.B.C.). The third is the Bristol monoplane, and following that the Hawker biplane (Anzani), followed again by the Parnall biplane. Even these, however, are not entirely rid of engine trouble, as it is known that some of these aeroplanes could have done better in their relative performances if the engines

Table showing Weight of Components as Per Cent. of Total All-Up Weight

Trials at Lympne, 1923 (*Single-Seaters*)

Firm.	Aircraft.	Mono. or Biplane.	Total wings.	Total tail.	Total body.	Total structure.	Total power unit.	Total load unit.
Air Nav. Co.	A.N.E.C. I. .	M	30·0	2·7	14·3	47·0	21·9	31·1
A. V. Roe	Type 558 . .	B	19·1	3·1	18·6	40·8	24·4	34·8
A. V. Roe	Type 560 . .	M	19·7	3·0	18·7	41·4	22·9	35·7
De Havilland	D.H. 53 . .	M	20·0	4·0	22·6	46·6	16·7	36·7
Gloucester	Gannet . .	B	16·8	2·5	23·3	42·6	17·4	40·0
Short Bros.	Gull . .	M	24·8	3·4	18·1	46·3	24·0	29·7
Handley Page	H.P. . .	M	29·8	4·0	17·1	50·9	11·1	37·3
R.A.E. Club	Hurricane . .	M	21·0	3·6	14·9	39·5	27·5	33·0
Parnall . .	Pixie I . .	M	14·0	3·5	17·3	34·8	27·1	38·1
Parnall . .	Pixie II . .	M	14·6	3·5	17·2	35·3	26·9	37·8
Vickers . .	Viget . .	B	21·6	3·6	18·5	43·7	25·4	30·9
Eng. Elec.	Wren . .	M	24·7	4·8	19·6	49·1	12·5	38·4

Trials at Lympne, 1924 (*Two-Seaters*)

Bristol . .	Brownie . .	M	21·8	2·1	20·7	44·6	15·7	39·7
Cranwell . .	Cranwell . .	B	19·6	4·0	19·8	43·4	16·5	39·1
Beardmore	Wee Bee . .	M	20·9	2·4	21·3	44·6	15·9	39·5
Westland	Wood Pigeon	B	18·1	2·7	20·0	40·8	16·0	43·2
Westland	Widgeon . .	M	15·6	2·6	29·8	48·0	14·1	37·9
Air Nav. Co.	A.N.E.C. II	M	20·6	2·9	17·5	41·0	18·2	40·8
Short Bros.	Satellite . .	M	21·7	3·4	26·2	51·3	13·4	35·3
Supermarine	Sparrow . .	B	23·1	3·1	14·6	40·8	19·9	39·3
A. V. Roe	Avis . .	B	19·2	2·4	27·1	48·7	14·4	36·9
Blackburn	Blue Bird . .	B						
Hawker . .	Cygnet I . .	B	16·5	3·2	12·8	32·5	20·5	47·0
Hawker . .	Cygnet II . .	B	16·8	3·3	13·1	33·2	18·6	48·2
Vickers . .	Vagabond . .	B	20·8	2·7	20·0	43·5	17·5	39·0
Parnall . .	Pixie III . .	M	18·3	3·8	16·5	38·6	19·0	42·4
Parnall . .	Pixie IIIA . .	B	23·8	3·5	15·4	42·7	17·8	39·5
Bristol	Bristol Fighter F.2B	B	13·3	1·85	12·2	27·35	45·1	27·55

had not given trouble. It does indicate, however, that for the purposes of the competition there is little to choose between the best monoplane and the best biplane, with the balance in favour of the monoplane.

"The competition was of considerable interest from an engine standpoint. As a result, it is possible to make a fair estimate of the power required for aircraft of this type. During the week a large number of engine failures were reported, and a general impression was that engines were unsatisfactory, whereas closer investigation shows that they were, in fact, doing well under the circumstances and that many of the troubles experienced were due to overloading. From the type tests of the 'Cherub' engine, the normal power should be 25.5 h.p. at 2,500 revs., and the 'Blackburne' 27 h.p. at 2,700 r.p.m. In every case these speeds were exceeded, and the aeroplanes were flown in most cases with the engines giving more than the maximum permissible r.p.m. Under these conditions it is not astonishing that a large number of failures were experienced.

"I think it is clear from the results of the competition that more power is required, and that engine speeds should be kept down if reliability is to be attained.

"Once again the geared type of engine failed to keep in the air, and although the aerodynamic advantage of the geared type is certain, it would appear that considerations of engine design preclude its use. That is most regrettable, as it puts an important limit to engine speed, and has the effect of increasing engine size still further."

Conclusions

"Having put on record the facts as they have been ascertained by this series of competitions, it is of considerable interest to review the position now, with a view to considering what steps are desirable for the future development of this type of aircraft. The main object of these competitions was to make flying cheap and safe, and thus to popularise it to the extent of making it part of our national life.

"You will observe that a start was made from the beginning with the glider, and progressive tests have been carried out with the single-seater light aeroplane and the two-seater dual-control type. From these experiments we have learned the horse-power necessary to give a reasonable performance for each of these types. In the case of the single-seater it is apparent that 15-18 h.p. is adequate for reasonable performance. In the case of the two-seater, it is clear that somewhere near 40 h.p. is required. Hitherto the aircraft designer has been dependent entirely on the engine designer, and aircraft design has progressed more by virtue of increased power than by increased aerodynamic efficiency. In the light aeroplane this position is being reversed, and the aircraft designer has now put forward his best efforts in order to obtain a maximum aerodynamic efficiency with a minimum structure weight, consistent with strength and robustness, if the light aeroplane is ever to become a factor in aviation.

"A glance at the table of weight schedules both for 1923 and 1924 shows that the structure weights of these aeroplanes are relatively high. The average figure appears to be 44 per cent. for the single-seaters and 42 per cent. for the two-seaters, as compared with a corresponding figure of about 32 to 33 per cent. for larger types of aircraft, with the same factor of safety. The figures for a Bristol Fighter are attached at the end of the table to give an approximate comparison.

"It will be noticed also that the average load carried amounts to 37 per cent. in the case of the single-seaters and 41 per cent. in the case of the two-seaters of the total, as against a figure of 25 to 30 per cent. for normal aircraft. Some of this difference is accounted for by the small amount of petrol carried by the light aeroplane. A further notable feature is the low value of the power-unit weight. That again is affected by the quantity of petrol which is included in this item. It would appear, however, that there is some margin for improvement in the structure weight by the adoption of new methods of construction and new materials. Hitherto these aeroplanes have been designed on established methods and with standardised materials, and it is possible that a reconsideration of these factors would lead to improvement. The figures for the Hawker aeroplanes indicate what can be done by painstaking design and close attention to details.

"It is also clear that the aeroplanes as tested at these competitions were not cheap to build, but, on the other hand, no effort has been made to manufacture them, because there is no market in which to sell them. Unless both first costs and running costs are kept down, the market will be a restricted one.

"The matter of petrol consumption must not be lost sight of. In the 1923 competition a consumption of 87 miles per gallon was attained. In the 1924 competition, so far as I can ascertain, the average consumption was of the order of 30 miles per gallon, and it is important that we do not, in our desire to provide plenty of power, increase this petrol consumption until it becomes once again an important factor in the operation of these light aeroplanes.

"Although a great deal of work has been done during the past three years towards the solution of the problem of supplying the cheap and safe aeroplane, a great deal more has to be done, and every care should be exercised that in correcting the defects which have been discovered by these competitions we do not sacrifice the important assets which the aeroplanes already possess.

"It will be seen that in all these tests and discussions the question of a small seaplane has not been considered. I would suggest that there is ample scope for such development in this country, where suitable waters are numerous and where a considerable proportion of the youth of the country are interested in matters concerning the sea. A step up in engine size is inevitable for the small seaplane, but I believe that a suitable aircraft could be made with an 1,100 c.c. engine."

The Discussion

Major Mayo wished to congratulate the lecturer on his very interesting paper, but thought there were one or two points in it that might be modified. With reference to the performances put up, for a power loading of 30-35 lbs./h.p. these were very good, but he thought the same results could be obtained with large machines provided we only expected the same performance. With reference to the lecturer's comparisons between the light 'planes and military or civil aircraft, the former having an L/D of 14 and the latter one of from 5/1 to 8/1, if military machines did not have to carry military loads, and were relieved of their various projections, he thought as good L/D ratios could be obtained as in the small machines. Major Buchanan had stated in the paper that the low speeds recorded at Lympne probably did not represent the actual low speeds of which the machines were capable. With this he (Major Mayo) did not agree. On the contrary, he thought the speeds recorded did represent fairly accurately the lowest speeds at which the machines could fly. This was rather borne out by the manner in which one or two of the machines stalled and sank to the ground during the low-speed tests. It was possible that the speeds did not represent the low speed as calcuated from the wing characteristics, but he thought they did tally with the speeds at which control was lost.

Major Mayo then turned to the question of policy. In the past, he thought, we had rather failed to define clearly what it was we wanted to achieve. If there was to be another competition next year, he thought the conditions should be laid down **now**, so as to give designers time to consider their machines. Also the rules should be more specific. For instance, if a school machine was wanted, it should be made clear which features were important, such as the relative positions of instructor and pupil, the view from both seats, etc. He would suggest that an engine competition be held next year. We could still use the present 1,100 c.c. engines in single-seaters. With reference to the size of power plant, although the question of consumption should be kept in mind it was relatively unimportant. The fuel cost, in any case, would not be more than about one-third of that of depreciation. What we wanted was cheapness and robust construction.

Dr. A. R. Low said he did not wish to enter into a lengthy discussion, but he did want to protest against the views advanced by Major Mayo that large machines could be designed to carry proportionately as great a load per horse-power as the light 'planes. There was no time to enter fully into that argument, but there were fundamental reasons why an increase in size could not be made while still retaining the efficiency of the small machines.

Mr. W. O. Manning congratulated Major Buchanan on his comparisons between the single-seaters, two-seaters and commercial aeroplanes. That was something which nobody had previously thought of doing. He had, however, one or two criticisms to make. For instance, he objected to the use, in the tables, of the structure weight, and thought a fairer basis for comparison would be provided by the figures for weight empty. On the question of the engine power required for light 'planes, we should settle, before deciding on that, what performance was wanted. There were certain advantages in having a small power plant. He had visited Martlesham while the "Wren" was there for test, and had been informed that the A.B.C. engine was running very well

[although being loaded at approximately 60 lbs./h.p.—ED.] mainly because one man could take out the engine and overhaul it in about half a day. For two-seaters, if an engines failed and it was of fairly small size, two men could remove it from the machine and carry it off, while if 2,000 c.c. engine were to be used it would require a small crane to handle the engine. With reference to the petrol consumption in this year's competitions, although as compared with the winning single-seaters of 1923 (87·5 miles per gallon) 30 m.p.g. or so might appear somewhat high, actually Mr. Manning doubted if any other vehicle known to man would carry two people at as high speed on such a low petrol consumption.

Mr. Manning then made the very practical suggestion that light 'planes be used for class racing, placing a limit on the engine power, but otherwise leaving designers a free hand. Not only would this provide excellent sport, but we should learn quite a lot from it.

Air Vice-Marshal Sir W. Sefton Brancker expressed hesitation at speaking in such technical company, but there were, he said, one or two questions which he would very much like answered. Was it, he asked, possible to use the light 'planes as flying models of larger machines? The second question was would it be possible for a mechanic of the type that might be expected to be employed by light 'plane clubs to look after the high-speed engines such as those used this year? He thought there were two respects in which we had failed this year. One was in the matter of engine power and the other was in price. The former was too low and the latter too high. As regards the light 'plane clubs, the matter was being very seriously pursued, and he thought it likely that the support of the Treasury would be forthcoming. Sir Sefton then told a story in which figured an old lady, certain wearing apparel, and a bumble-bee.

Capt. W. H. Sayers raised the point of comparing large and small machines on a basis of structure weight. If the figure for structure weight included such items as controls, seats, etc., the comparison was not fair, because these items were very nearly as heavy for a light 'plane as for a large machine. On the monoplane *versus* biplane controversy he thought the biplane offered a lighter structure, but it would certainly be more expensive to build and probably more expensive to maintain. On the other hand, the monoplane could, for the same performance, be more robustly built and also more cheaply. He entirely disagreed that more power was required, and to put up the power would, he thought, be a retrograde step. What was wanted was not more power, but the same power as this year, but for longer periods. In other words, the 1924 actual engine power with reliability. That the performance was sufficient appeared to be indicated by the fact that the Lympne light 'planes had approximately the same performance as the Avro training machine. They might require a slightly longer run along the ground—in other words, take slightly longer to accelerate—but once in the air they climbed as well as the Avro. He did not agree that petrol consumption was a negligible quantity, and suggested that placing a limit on the amount of fuel would automatically limit the power that could be used. Limiting the engine capacity merely had the effect of tempting to run the engines at too high speed, with resultant loss of reliability.

Flight-Lieut. Rollo A. de H. Haig asked whether there was not, from the point of view of machines suitable for school work, some objection to the low-wing monoplane. He had, he said, turned over several times on landing, fortunately for him always on biplanes. He thought the pilot would be in a somewhat unprotected position in the low-wing monoplane.

Sir Henry White-Smith expressed some doubt as to the wisdom of changing the power of light 'plane engines. We had not, he thought fully explored the possibilities which the 1,100 c.c. engine offered, and there was no doubt that the reliability of the present engines would be considerably increased during the next year or so. He agreed with Major Mayo that the rules for next year's competitions should be published at once. But it would, he thought, be advisable if our aim were more exactly defined. Was it a school machine or a touring machine we wanted, or what? Sir Henry then made the very sound suggestion that for next year's competition, if we were to have competitions next year, it might be a good plan, and would help to get the price down, if the Air Ministry were to incorporate in the conditions, a clause to the effect that the winning machine would be ordered, in a batch of 25 or 50, or whatever number was required, at a certain stated price. It would then be up to the constructors to devise forms of construction which would allow of selling their machines at that price.

Mr. Roy Fedden, speaking of the lecturer's remarks concerning the geared engines at Lympne, did not think the whole blame should be laid at the door of the engines. If aeroplane designers could be made to understand torque-ft.-lbs., we should not see such mountings as were to be found on some machines. He was anxious to find out whether the 40 b.h.p. suggested as the power for light 'plane two-seaters was likely to be required all the time or whether only occasionally, with, say, 30 h.p. or so for normal flying. He was quite certain that with another year's development the 1,100 c.c. engine could be made reliable. His figures for average petrol consumption in this year's Lympne competitions differed slightly from those given by the lecturer, and he had estimated that the average was 33½ miles per gallon, which was not at all bad. With engines specially tuned for consumption, as they had been in the 1923 single-seater trials, the two-seaters would probably do 40 to 44 miles per gallon. He personally was against an increase in power, and thought we should see what we could do first with the present power.

Mr. F. Sigrist thought this year we had been trying to produce too efficient machines. Light construction meant expensive construction. A larger engine was wanted, then heavier and cheaper construction could be used. The larger engine could, he thought, be produced as cheaply as the small engine, and as for the question of fuel consumption this could be neglected. If a man ran a machine and kept careful tally of his expenditure, the petrol item would be so small a percentage that it was not worth bothering about effecting much of a saving.

Before calling upon Major Buchanan to reply, Col. Tizard had a few words to say on the subject of light 'planes. After listening to the lecture, he felt that the figures given were of no use to anybody. It was pointed out that the site was chosen because of a range of hills which enabled competitors to make use of rising air currents. That very fact appeared to him to invalidate any figures as to performance. He thought we had failed this year in the most important thing of all: that of price. Whatever the machines were wanted for, for clubs, private individuals, etc., price was the determining factor. What was wanted was machines cheap in first cost and cheap to run, and those we had not got.

Major Buchanan did not agree with Major Mayo that larger machines could be as efficient as the light 'planes. He had fixed in his own mind, as a sort of standard for comparison, the D.H.53 with Blackburne "Tomtit" engine. This machine had quite a reasonably good performance, and was, on the whole, standing up well to ordinary service. He could not, therefore, agree that this year's 1,100 c.c. engines should be used for single-seaters. He thought the performance of this year's two-seaters adequate, except for climb. A better rate of climb was needed. In reply to Sir Sefton Brancker, aerodynamic ideas could be tested out on light 'planes, but we could not yet get same useful load out of commercial machines as we had got out of the light 'planes. He did not feel competent to discuss with Mr. Fedden matters of engine design, but if, as Mr. Fedden had suggested, the geared engine could be made as reliable as the ungeared, it would confer very real advantages on the aeroplanes. He did not think it necessary to increase the power of the present light 'plane engines, but we should try to make them reliable with the power they were giving.

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Steel versus Lighter Alloys

WE would remind our readers that it is to-morrow, Friday, November 7, that Colonel Belaiew is reading his paper on above subject before the Institution of Aeronautical Engineers. Colonel Belaiew is one of our foremost authorities on the internal structure of steel, and in view of the growing tendency to employ aluminium alloys in aircraft his paper should be of more than ordinary value. The meeting will take place at the Engineers' Club, Coventry Street, London, W., and will commence at 6.30 p.m. Those interested should apply to the Hon. Secretary of the Institution of Aeronautical Engineers, 60, Chancery Lane, London, W.C. 2.

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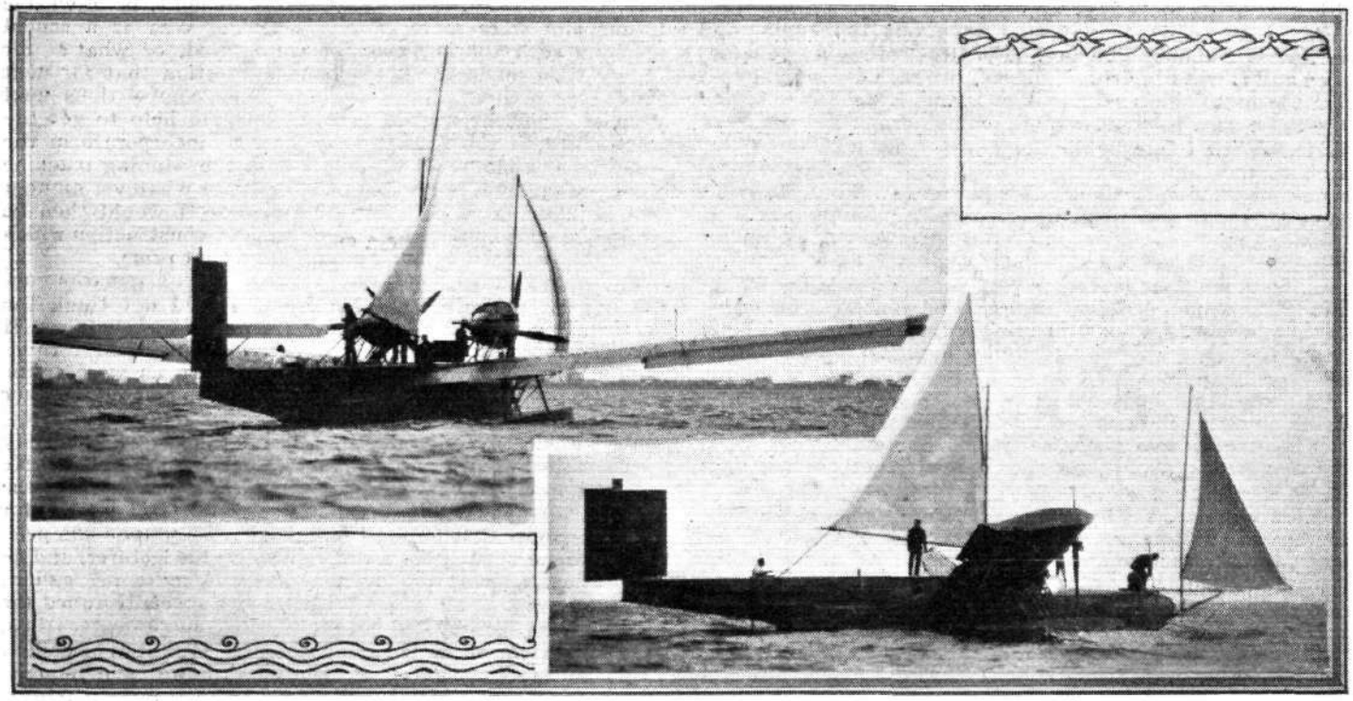
Amsterdam-Batavia Flight

IN last week's issue we gave the date of departure from Amsterdam of the Dutch airmen who are flying to Batavia as August 14. This should have been October 1—the date August 14, as a matter of fact, refers to the issue of FLIGHT in which preliminary details of this flight were published. As reported last week, a new Rolls-Royce engine, etc., was sent out to Philippopolis, where they crashed at an early stage of their journey. All necessary repairs were effected, and on November 2 they started off once more, and arrived safely at Constantinople in the afternoon. They left again for Angora the following morning.



CLOSE-HAULED : These two photographs show the Rohrbach Ro. II, two Rolls-Royce "Eagle" engines, rigged with jury masts and sails. The machine is thus to some extent independent of wind direction, and can proceed slowly in case of total engine failure. The Rohrbach Metal Aeroplan Company A/S, of Copenhagen, in sending us these photographs, state that the Ro. II, on October 24, established the following world's records : Speed over 500 km. from 122.9 km./h. (76.8 m.p.h.) to 157 km./h. (98 m.p.h.) ; speed over 1,000 km. from 119.54 km./h. (74.75 m.p.h.) to 153.5 km./h. (96 m.p.h.). Distance with useful load of 250 kg. from 925 km. (578 miles) to 1,102 km. (690 miles) ; distance with useful load of 500 kg. from 750 km. (470 miles) to 1,102 km. (690 miles).

"Jabiru" Wins Lamblin Cup

THE Farman four-engined monoplane "Jabiru," winner of the Grand Prix for commercial aeroplanes, has just secured first place in the Coupe Lamblin, presented by the inventor of the famous radiator. The "Jabiru" was piloted by Adjutant Hernu. Second prize was won by Lieut. Rabatel on a Dewoitine, and third prize by Capt. Battesti on a Nieuport-Delage. Another Nieuport-Delage, piloted by Lieut. Tourre, secured fourth place, and Lieuts. Carrie and Faure were fifth on a Caudron C.2. The competition was flown over a 1,200 km. circuit (750 miles), and the winner's time was 5 hrs. 37 mins. 18$\frac{1}{5}$ secs. The Coupe Lamblin is flown to a formula, by which the amount of load carried is taken into consideration. The Farman "Jabiru" carried the equivalent of 12 passengers. It is fitted with four 180 h.p. Hispano-Suiza engines. All five machines were fitted with Lamblin radiators.

Ogilvie and Partners

THE well-known and pioneer firm of consulting aeronautical engineers, Ogilvie and Partners, ceased to exist after October 29, Lieut.-Col. A. Ogilvie, the founder and governing director, having decided to go into voluntary liquidation. He has, therefore, dissolved the partnership, which, besides himself, consisted of Colonel W. A. Bristow, M.I.E.E., M.I.A.E., F.R.Ae.S. ; Major R. H. Mayo, O.B.E., M.A., Assoc. M.Inst.C.E., F.R.Ae.S. ; and Dr. H. C. Watts, D.Sc., Assoc. M.Inst.C.E., Assoc. Inst.N.A., F.R.Ae.S. Colonel Ogilvie is shortly leaving England on a six months' world tour, and Colonel Bristow, who has made a special study of internal combustion engine practice and its application to aircraft, is retaining the old address of 104, High Holborn, as a consulting engineer. Dr. Watts, who is well known in connection with air screws, will also continue his consultative activities, while Major Mayo, who has been primarily concerned with the aeroplane side of the business, has not yet decided upon his future activities.

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